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ABB Inc.
Taft, Stettinius & Hollister LLP
One Indiana Square
Suite 3500
Indianapolis, IN 46204-2023

EXAMINER
GUGGER, SEAN A

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOUKO NIIRANEN, SLAVOMIR SEMAN, and REIJO VIRTANEN

Appeal 2015-007961
Application 13/543,331
Technology Center 2800

Before CHUNG K. PAK, JEFFREY R. SNAY, and JENNIFER R. GUPTA, *Administrative Patent Judges*.

SNAY, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellants[2] appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–3 and 8–12. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We refer to the Specification ("Spec.") filed July 6, 2012, as amended; Final Office Action ("Final Act.") dated July 28, 2014; Appellants' Appeal Brief ("App. Br.") dated April 20, 2015; Examiner's Answer ("Ans.") dated July 1, 2015; and Appellants' Reply Brief ("Reply Br.") dated September 1, 2015.

[2] Appellants identify ABB OY as the real party in interest. App. Br. 2.

BACKGROUND

The subject matter on appeal relates to methods for controlling a doubly-fed induction machine. Spec. ¶ 2, claim 1. Claim 1 is reproduced from the Claims Appendix of the Appeal Brief as follows:

> 1. A method of controlling a doubly-fed induction machine by a frequency converter including a rotor side converter (INU) connected to a rotor circuit of the doubly-fed induction machine (DFIG) and having a control system with rotor flux as a feedback variable, a grid side converter (ISU) connected to an AC power network, and a direct voltage intermediate circuit (DC) connected between the rotor side converter (INU) and the grid side converter (ISU), the method comprising:
>
> forming a rotor flux reference ($\Psi_{r,ref}$), the rotor flux reference and the rotor flux used as the feedback variable being estimated;
>
> forming a damping signal ($\Psi_{ref,D}$), the damping signal being proportional to oscillation in an estimated torque, oscillation in an estimated stator power or oscillation in a measured intermediate DC circuit voltage, and the damping signal being obtained from an oscillating signal by filtering the oscillating signal with one of (i) low-pass and high-pass filters and (ii) a bandpass filter;
>
> summing the damping signal and the rotor flux reference for obtaining a modified rotor flux reference (Ψ_{ref}); and
>
> feeding the modified rotor flux reference to a controller of the rotor side converter (INU) for damping sub-synchronous resonances.

Claim 10 also is written in independent form. Each of the remaining claims on appeal depends from either claim 1 or claim 10.

REJECTION

The Examiner maintains the following ground of rejection:[3]

Claims 1–3 and 8–12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Hughes[4] and Corcelles Pereira.[5]

DISCUSSION

Appellants rely on the same arguments with regard to each of independent claims 1 and 10, and separately argue only claims 8 and 9. App. Br. 8–11. In accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 1 as representative and decide the appeal as to Rejection I based on the representative claim alone. Claims 2, 3, and 10–12 stand or fall with claim 1. Appellants' separate arguments concerning claims 8 and 9 are separately addressed.

Claim 1

The Examiner finds that Hughes discloses a method for controlling a doubly-fed induction machine which includes all of the steps recited in claim 1, except that Hughes does not specify that the damping signal is proportional to oscillation in a measured intermediate DC circuit voltage.[6] Final Act. 2–3. For that recitation, the Examiner relies on Corcelles Pereira, and finds that one skilled in the art would have had a reason "to make the

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[3] Final Act. 2–4; Ans. 2.
[4] WO 2006/030183 A1, published March 23, 2006 ("Hughes").
[5] US 2008/0150285 A1; published June 26, 2008 ("Corcelles Pereira").
[6] Claim 1 recites that the damping signal is "proportional to [i] oscillation in an estimated torque, [ii] oscillation in an estimated stator power *or* [iii] oscillation in a measured intermediate DC circuit voltage." (Emphasis added).

dampening control signal of Hughes be proportional to the DC circuit voltage, as disclosed by Corcelles Pereira, in order to provide set points based on the grid voltage." *Id.* at 3–4.

Appellants argue that the recited damping signal is added to a scalar variable to change the magnitude of the rotor flux reference, whereas Hughes applies a damping signal to affect rotor flux angle. App. Br. 8. The Examiner responds that claim 1 recites adding the damping signal to a rotor flux reference without specifying that the flux reference is a scalar variable or that the summation affects a magnitude of the flux reference. Ans. 2–3. We agree with the Examiner's characterization of claim 1. Appellants do not dispute the Examiner's finding that Figure 7 of Hughes depicts a summation of damping signals (Uaux1, Uaux2, Uaux3) with a reference value ($\underline{\Psi}_{rangref}$). *Compare* Final Act 3 *with* App. Br. 8–10. Hughes identifies that reference value as representing a "rotor flux vector angular position reference value." Hughes 20. The Examiner's reliance on reference value ($\underline{\Psi}_{rangref}$) as a rotor flux reference is supported by a preponderance of the evidence of record. Appellants' argument, premised on a feature not found in claim 1, is not persuasive.

Appellants further argue that "[t]he aim of the technique disclosed in Hughes is to emulate the control action of a conventional synchronous generator," and for that reason could not achieve "significant improvement in the sub-synchronous resonance damping." App. Br. 8–9. Here too, Appellants' argument is premised on a purported recitation—significant improvement in the sub-synchronous resonance damping—that is not found in the claim. Neither do Appellants present evidence or technical reasoning

to support the otherwise conclusory statement that the control method in Hughes would not accomplish sub-synchronous resonance damping.

Appellants additionally argue that "Hughes does not disclose or suggest providing a damping signal from an oscillating variable." *Id.* at 9. However, the Examiner cites and relies on Corcelles Pereira in finding that one of ordinary skill would have had a reason to provide this recited feature to the method of Hughes. Final Act. 3–4. Appellants' argument does not address the rejection articulated by the Examiner and, therefore, does not identify reversible error.

For the foregoing reasons, we sustain the Rejection as to claim 1. Because each of claims 2, 3, and 10–12 stands or falls with claim 1, we also sustain the Rejection as to these claims.

Claims 8 and 9

Appellants argue that Hughes fails to disclose adjusting either the amplitude or phase of the damping signal, as recited in claim 8 and 9, respectively. App. Br. 10–11. In response, the Examiner points to Hughes at page 23, third paragraph, where Hughes teaches that "[t]he [second auxiliary control] signal is then passed through a compensator 81 to provide the necessary phase shift and an amplifier 82 to provide the necessary gain." Ans. 3. Based on that disclosure, the Examiner finds that "Hughes discloses both the phase and amplitude of the damping signals are adjusted." *Id.* Appellants do not address the Examiner's finding or the cited passage of Hughes in their Reply Brief.

On this record, we conclude that the Examiner's finding that Hughes teaches adjustment of both phase and amplitude of the damping signal is

supported by a preponderance of the evidence. Accordingly, we also sustain the Rejection as applied to each of claims 8 and 9.

DECISION

The Examiner's decision rejecting claims 1–3 and 8–12 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136.

AFFIRMED